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Allcock et al.

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(54) **LAMP ASSEMBLY**

(75) Inventors: **Michael Allcock**, Worcestershire (GB); **Stuart Wilson**, Worcestershire (GB)

(73) Assignee: **F.W. Thorpe Plc**, Worcestershire (GB)

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(51) **Int. Cl.**[7] **F21V 5/00**
(52) **U.S. Cl.** **362/223**; 362/225; 362/245; 362/336

(58) **Field of Search** 362/223, 225, 362/240, 244, 245, 308, 311, 336, 337, 338, 340

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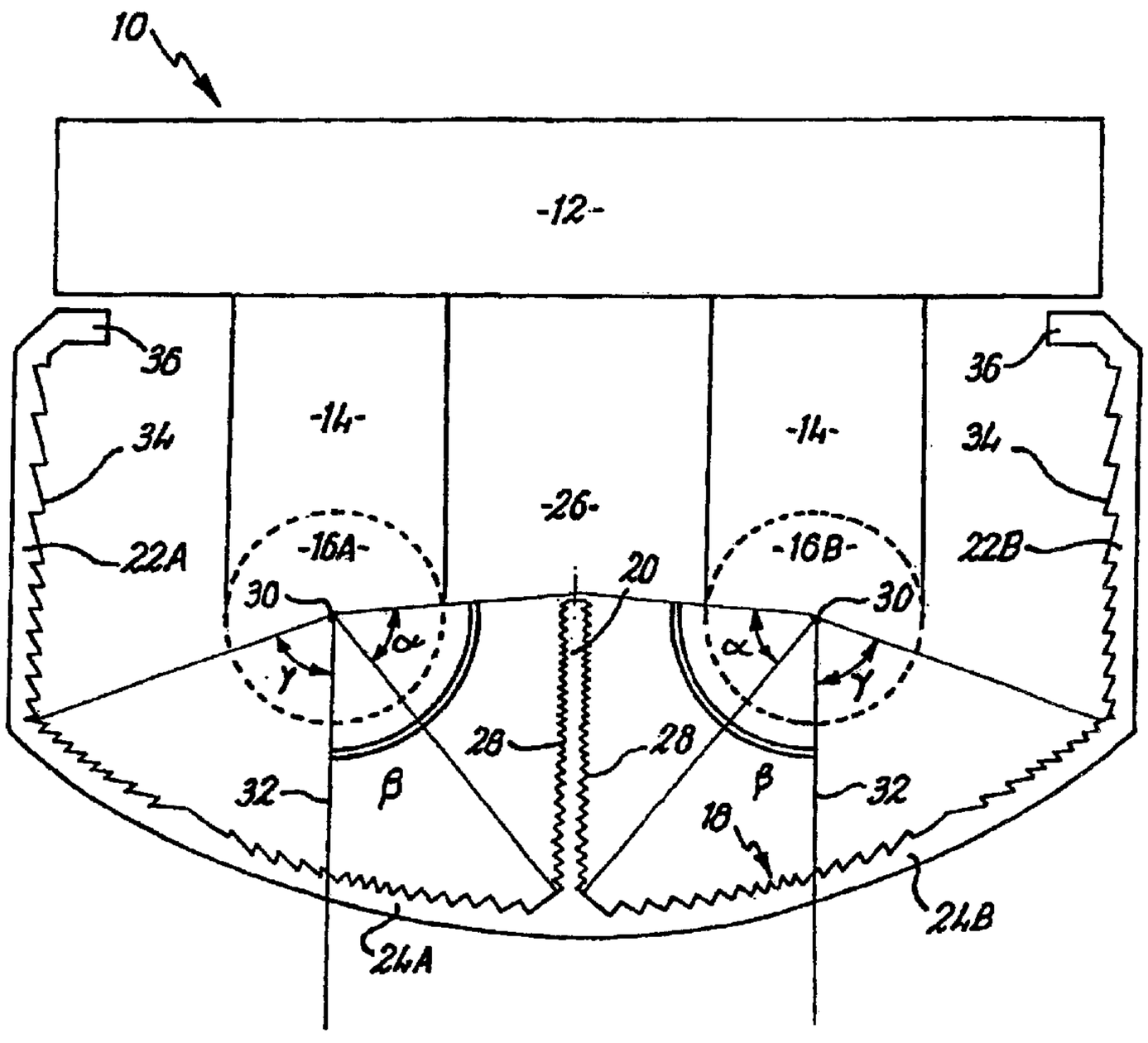
Primary Examiner—Y. My Quach-Lee
(74) *Attorney, Agent, or Firm*—Nixon & Vanderhye P.C.

(57) **ABSTRACT**

The assembly has two lamps, such as fluorescent tubes. A cover is a co-extrusion having a baffle between the lamps and shroud portions outermost of the cover. The baffle blocks at least some of the light output of the lamps from crossing the region between the lamps. This helps reduce glare, which is further reduced by the configuration of the shrouds.

16 Claims, 1 Drawing Sheet



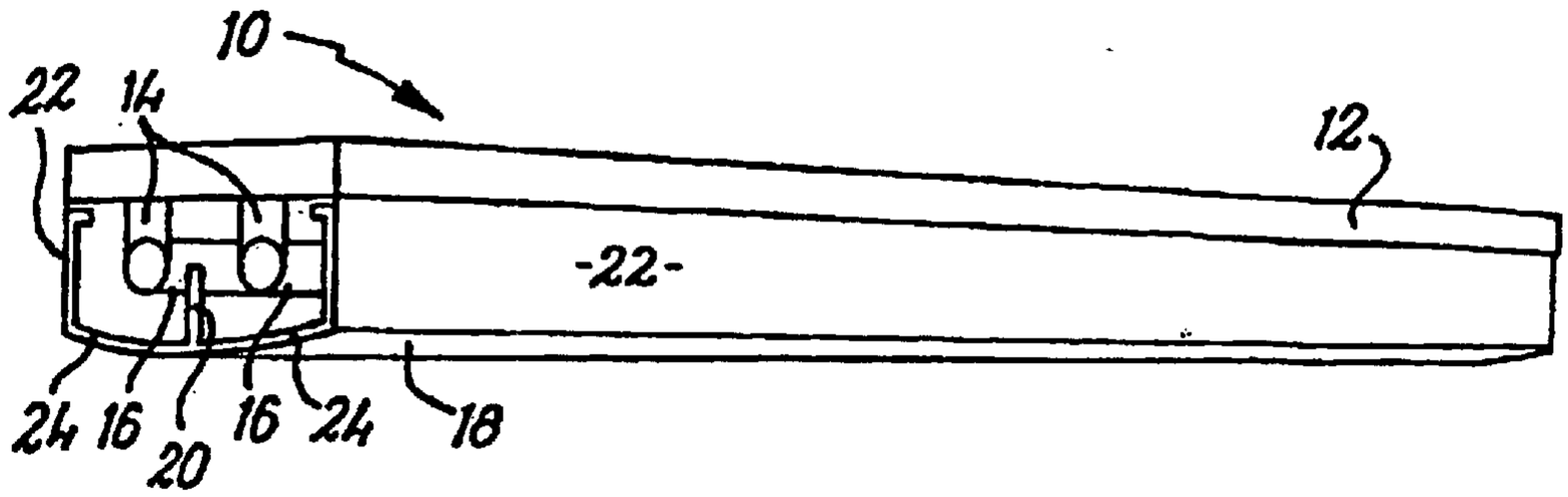

10
22
14
12
-22-
24
16
20
16
24
18

FIG. 1

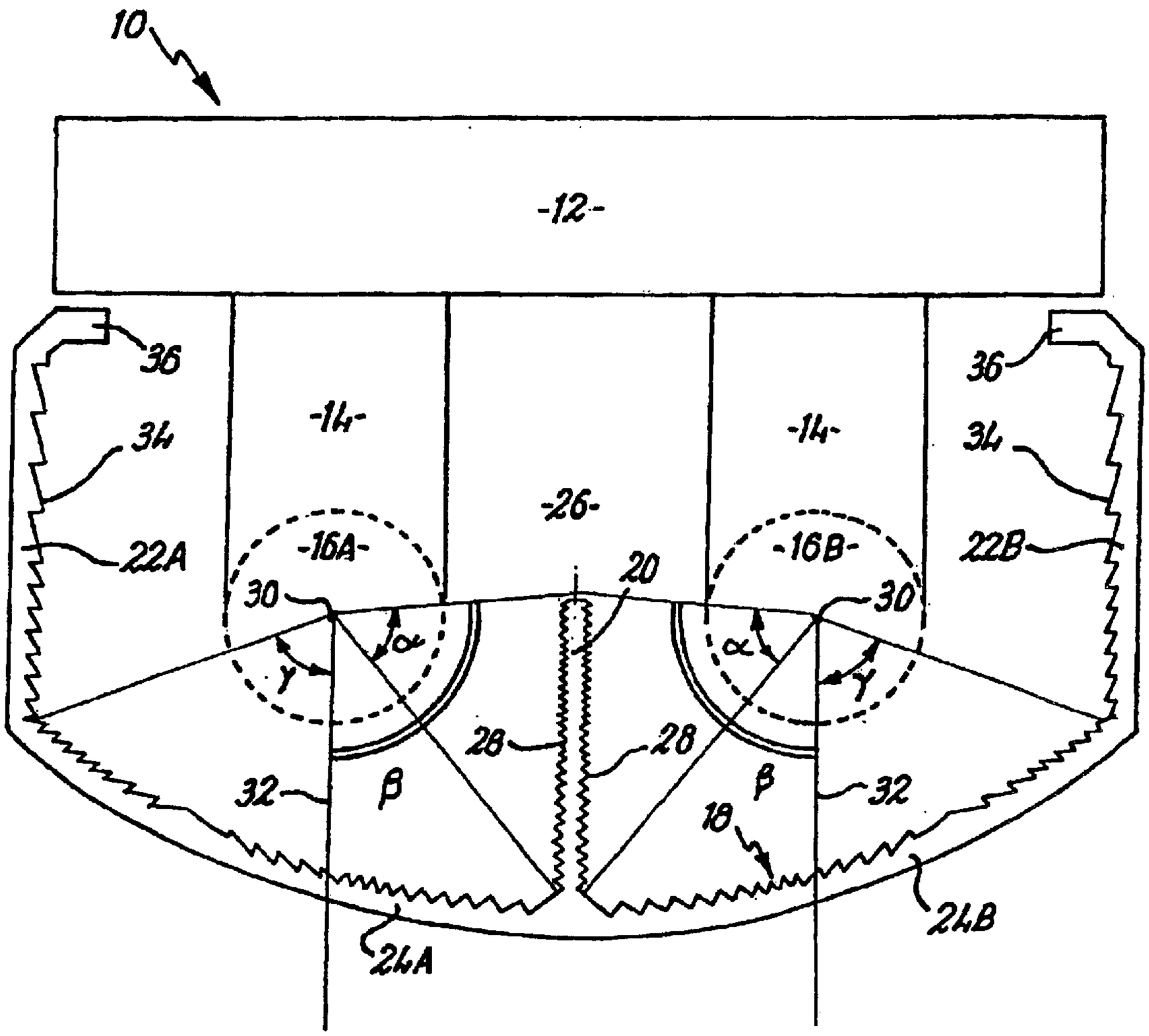

10
-12-
36
34
22A
-14-
-16A-
30
α
γ
20
-26-
28
β
32
18
24A
-16B-
-14-
36
34
22B
24B

FIG. 2

LAMP ASSEMBLY

This application is the US national phase of international application PCT/GB01/01163 filed 19 Mar. 2001, which designated the US.

BACKGROUND AND SUMMARY OF THE INVENTION

The present invention relates to multi-lamp assemblies and in particular, but not exclusively, to lamp assemblies for use with linear lamps, such as fluorescent tubes and the like.

The present invention provides a lamp assembly which comprises mountings to hold, in use, a plurality of lamps, there being at least two lamp positions which are spaced apart to define a region between the positions, the assembly further comprising a window corresponding with each lamp position and through which light leaves the assembly during use, and a baffle member positioned in the region to allow each lamp to illuminate directly a respective window and to block, in use, at least some of the light output of lamps at these positions from crossing the region to leave through a window corresponding with another lamp.

Preferably the baffle member is positioned to block at least some of the light leaving the lamp positions at an angle below a minimum angle from a vertical line extending down from the lamp position. The baffle member may be positioned to block at least some of the light leaving each lamp position from reacting the other lamp position. The baffle member may be clear, translucent, opaque or semi-opaque and is preferably formed to deflect incident light, such as by means of prisms. The baffle member surface may be formed as a series of refracting prisms. The lamp assembly may comprise mountings formed to support parallel linear lamps, the baffle member being elongate and positioned to extend parallel with the lamps along the region between the lamp positions.

The lamp assembly may further comprise at least one shroud member spaced from one lamp position in the direction generally opposite the direction of the other lamp position, the shroud member serving to block at least some of the light leaving said one lamp position above a maximum angle from a vertical line extending down from the lamp position. Preferably each lamp position is provided with a shroud member. The or each shroud member may be clear, translucent, opaque or semi-opaque. The surface of the or each shroud member is preferably formed to deflect incident light, such as by means of prisms. The surface of the or each shroud member is preferably formed as a series of refracting prisms. The lamp assembly may comprise mountings formed to support parallel linear lamps, the or each shroud member being elongate and positioned to extend parallel with the lamp positions.

The baffle member and the or each shroud member are preferably linked to form a cover member within which the lamp positions are located. There may be a web section extending from the baffle member to link the baffle member with the or each shroud member. The web section preferably provides the said windows. The baffle member, web section and the or each shroud member may be formed as a co-extrusion.

The invention also provides a cover for a lamp assembly according to any of the preceding definitions, the cover comprising a baffle member as aforesaid.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the present invention will now be described in more detail, by way of example only, and with reference to the accompanying drawings, in which:

FIG. **1** is a schematic perspective view of a lamp assembly according to the present invention; and

FIG. **2** is a vertical, axial section of the lamp assembly of FIG. **1**, on an enlarged scale.

FIG. **1** shows a lamp assembly **10** which may, for instance, be suspended from a ceiling in a building.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The assembly **10** has a base **12** for attachment to the ceiling, and which provides mountings **14** for holding two lamps **16A, 16**B. The lamps **16** are linear lamps, such as fluorescent tubes, T5 r T16 lamps. FIG. **1** shows mountings **14** at one end of the lamps, there being equivalent mountings (not shown) at the other end of the base **10**, for supporting the other end of the lamps **16**. The mountings **14** also provide electrical connections to the lamps **16**. Conventional control gear for star and driving the lamps **16** is housed within the base **12**.

The lamp assembly **10** also includes a cover **18**, the details of which are most clearly shown in FIG. **2**. It should be noted that the terms "base" and "cover" are used in a manner which is conventional within the art, notwithstanding that after installation of the assembly **10**, the base **12** will generally be uppermost (immediately below the ceiling), and the cover **18** will be lowermost, hanging from the base **12**.

The cover **18** is a co-extrusion of constant cross-section along the length of the assembly **10**. The cover **18** has several different portions, as follows. A baffle portion **20** is located centrally, between the lamps **16**. Shroud portions **22** are located outermost and are connected with the baffle portion **20** by web portions **24**. The portions **20, 22, 24** are all continuous along the whole length of the cover **18**.

The baffle portion **20**, when in use, extends generally vertically up from the web portion **24**, within the region **26** between the lamps **16**. The vertical faces **28** of the baffle portion **20** are faceted to form refracting prisms in a manner conventional in itself, so as to deflect incident light down toward the web portion **24**. Diffusion, refraction or reflection may be used for deflection. The body of the baffle portion **20** may be opaque or semi-opaque, so that any light not deflected will be wholly or partially absorbed within the baffle portion **20**. The body of the baffle portion may be clear or translucent, the deflection being achieved by the prisms.

The upper and lower extremities of the vertical faces **28** subtend an angle α at the axis **30** of the lamps **16** so that any light leaving the lamps **16** within this range of angles will impinge on the baffle portion **20** and be blocked or partially blocked from travelling further across the region **26**. In particular, the light blocked in this manner and originating from the lamp **16A** will be prevented from crossing the region **26** to leave the lamp assembly **10** past the lamp **16**B. Similarly, at least some of the output of the lamp **16**B will be blocked from leaving the lamp assembly **10** past the lamp **16**A. It can also be seen from FIG. **2** that the baffle portion **20** extends above the height of the lamps axes **30**. The baffle portion **20** therefore serves to block at least some of the light from either of the lamps **16** reaching the other lamp. Interlamp reflections of this nature will cause a reduction in the overall output of the assembly **10**, and thus of its efficiency, and this drawback is found to be reduced by the presence of the baffle portion **20**.

The upper extremity of the faces **28** also serve to define a minimum angle, relative to a vertical line **32** extending down from the axis **30** of each lamp **16**, this angle being

designated β in FIG. **2** (shown via a double arc between the vertical line **32** and the line from the axis **30** to the upper extremity of the corresponding face **28**). Light leaving the lamps **16** will only pass above the baffle portion **20**, and thus be unaffected by its presence, if the angle from the line **32** is greater than β. This is significant in reducing glare, as will be described.

The shroud portions **22** are each spaced from one of the lamps **16** in the direction generally opposite the direction of the other lamp **16**. Thus, the lamp **16**A is between the shroud **22**A and the lamp **16**B, while the lamp **16**B is between the shroud **22**B and the lamp **16**A. Thus, while the baffle portion **20** is within the region **26**, the shrouds **22** are located outside the region **26**, to the other sides of the lamps **16**.

Each shroud portion **22** is a generally vertical wall which has a vertical face **34** facing the nearest lamp **16** and which is formed as a series of refracting prisms, to deflect incident light down toward the web portion **24**, generally in the manner which has been previously described in relation to the vertical faces **28** of the baffle portion **20**.

A peripheral flange **36** is provided at the upper edge of each face **34**, for use in attaching the cover **18** to the base **12**.

The bodies of the shroud portions **22** may be opaque or semi-opaque, such as an opal, opalised or satin material to have a softening, diffusing or blocking effect on any light which passes into the shroud **22** without being deflected by the surface prisms. The action of the prisms may deflect light sufficiently for the shroud portions to be of clear or translucent material.

No light can leave the assembly **10** above the shrouds **22**, by virtue of the presence of the base **12**. In order to leave the assembly **10** below the shrouds **22**, light must leave a lamp **16** with an angle from the vertical line **32** no greater than a maximum angle indicated as γ in FIG. **2**.

The web portions **24** extend inwardly from the shrouds **22**, to the baffle portion **20** and may be clear or diffusing material as required by the intended application of the lighting. The web portions **24** provide windows for light leaving the assembly **10**, defined on either side of the baffle portion **20**, each window being between the baffle portion **20** and one of the shroud portions **22**. The relative positions of the baffle portion **20** and the shrouds **22** ensures that the light leaving through either of these windows will have been controlled, as follows.

Light leaving through the left-hand web portion **24**A (as seen in FIG. **2**) will have reached the web portion **24**A direct from the lamp **16**A if originally leaving the lamp below the maximum angle γ defined by the shroud portion **22**A, or below the angle (β-α) defined by the lower edge of the baffle portion **20**. Appropriate positioning of these features can set these angles to ensure that this direct light will not cause unacceptable glare. In particular, it is common to seek to provide direct lighting of this nature from tubular lamps at an angle of no greater than about 65° from the vertical. At angles greater than this, the light can cause glare by entering the peripheral or direct vision of a person in the room being illuminated. Below this angle, the light will reach a user from a position more directly above the user's head and thus generally outside direct or peripheral vision. Other light will leave the web portion **24**A having been reflected from the baffle portion **20** or shroud portion **22**A, thus softening this light and preventing it from contributing unacceptably to glare.

Furthermore, it can be seen that the window provided by the web portion **24**A does not allow the lamp **16**B to be viewed directly through the web portion **24**A. This arises from the relative heights of the top of the baffle portion **20** and the bottom of the shroud portion **22**A, in relation to the heights and spacings of the lamps **16**A. Thus, when the lamp assembly **10** is sufficiently far away from a user for a ceiling-mounted lamp to be visible in the peripheral vision of a reader, for instance, lamp image brightness and consequential glare will be reduced from that which would occur without the baffle portion **20** being present. Furthermore, the prism deflectors on the vertical faces **28**, **34** will deflect more of the light output downwardly (to small angles from the vertical lines **32**).

A further effect arises from the presence of the baffle portion **20**, which may be beneficial in some circumstances. The presence of the baffle portion **20** is found to provide some thermal containment around each lamp **16**, which is greater than would be provided in the absence of the baffle portion **20**, by virtue of the physical barrier provided by the baffle portion **20**. It has been found that this has the effect of causing the lamps **16** to run at higher temperatures than would be the case without the presence of the baffle **20**. In particular, this effect can be beneficial with T5 lamps, which run most efficiently at temperatures above the ambient temperature found in many working environments. The baffle portions **20** contribute to an increased lamp operating temperature, which therefore further increases the efficiency of the assembly **10** and the effectiveness of the lighting provided by it.

The cover **18** has been described as a co-extrusion. Techniques of co-extrusion are well known to the skilled reader. Co-extrusion allows the material of the various portions **20**, **22**, **24** to be selected individually, according to the function those portions are intended to serve. Thus, in one example, the baffle portion **20** and the web parts **24**A,**24**B may be clear material, with the baffle effects of the baffle portion **20** being provided mainly by virtue of the prism surface provided on the faces **28**, the prisms serving to refract light downwards, outside peripheral vision. However, the shroud portions **22**A,**22**B in this example are of a diffusing material such as a satin, opal or opalised material so that any light leaving the assembly **10** through the shrouds **22** will be soft and diffused. However, the prism faces **34** will tend to deflect incident light down to the web portions **24**, by refraction, so that the shroud portions may be of clear or translucent material. The overall effect is to tend to direct the light output down through the web portions **24**, and away from leaving through the shroud portions **22**, so that in comparison with the situation with the cover **18** removed, more of the light output is directed in a generally downward direction at angles which will provide good lighting without glare, and less light is allowed to leave at angles which could contribute to glare.

Many variations and modifications can be made from the apparatus described above, without departing from the scope of the invention. In particular, the particular shapes, dimensions and relative dimensions of the features can be varied, according to the properties and angles required of the light output. Various different materials may be used for the various regions of the cover, according to their light reflecting and transmitting characteristics. Although the cover **18** has been described as a single article formed by co-extrusion of different materials, it is envisaged that the cover **18** could be formed by extrusion from a single material, or could be formed by assembling various components, each formed separately.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the

Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

What is claimed is:

1. A lamp assembly which comprises mountings to hold, in use, a plurality of lamps, there being at least two lamp positions which are spaced apart to define a region between the positions, the assembly further comprising a window corresponding with each lamp position and through which light leaves the assembly during use, and a baffle member positioned in the region to allow each lamp to illuminate directly a respective window and to block, in use, at least some of the light output of the lamps at these positions from crossing the region to leave through a window corresponding with another lamp, wherein each lamp position is provided with a shroud member formed to deflect incident light by means of prisms, each shroud member being spaced from a respective lamp position in a direction generally opposite the direction of the other lamp position, the shroud member serving to, block at least some of the light leaving said respective lamp position above a maximum angle, which is a window portion exit angle, from a vertical line extending down from said respective lamp position.

2. A lamp assembly according to claim **1**, wherein the baffle member is positioned to block at least some of the light leaving the lamp positions at an angle below a minimum angle, which is a baffle angle, from a vertical line extending down from the lamp position.

3. A lamp assembly according to claim **1**, wherein the baffle member is positioned to block at least some of the light leaving each lamp position from reaching the other lamp position.

4. A lamp assembly according to claim **1**, wherein the baffle member is clear, translucent, opaque or semi-opaque.

5. A lamp assembly according to claim **1**, wherein the baffle member is formed to deflect incident light.

6. A lamp assembly according to claim **5**, wherein the baffle member is formed to deflect light by means of prisms.

7. A lamp assembly according to claim **6**, wherein the baffle member surface is formed as a series of refracting prisms.

8. A lamp assembly according to claim **1**, and comprising mountings formed to support parallel linear lamps, the baffle member being elongate and positioned to extend parallel with the lamps along the region between the lamp positions.

9. A lamp assembly according to claim **1**, wherein the or each shroud member is clear, translucent, opaque or semi-opaque.

10. A lamp assembly according to claim **1**, wherein the surface of the or each shroud member is formed as a series of refracting prisms.

11. A lamp assembly according to claim **1**, comprising mountings formed to support parallel linear lamps, the or each shroud member being elongate and positioned to extend parallel with the lamp positions.

12. A lamp assembly according to claim **1**, wherein the baffle member and the or each shroud member are linked to form a cover member within which the lamp positions are located.

13. A lamp assembly according to claim **1**, wherein a web section extending from the baffle member links the baffle member with the or each shroud member.

14. A lamp assembly according to claim **13**, wherein the web section provides the said windows.

15. A lamp assembly according to claim **13**, wherein the baffle member, web section and the or each shroud member are formed as a co-extrusion.

16. A cover for a lamp assembly according to claim **1**, the cover comprising the baffle member.

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